

RISK BEHAVIOURS OF AGRICULTURAL HOLDINGS MANAGERS ON MANAGEMENT AND DECISION MAKING PROCESS IN AGRICULTURAL PRODUCTION; KIRŞEHİR PROVINCE CASE

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In case of uncertainty and increased risk, it may be more difficult for business owners to make decisions. Business owners, who are aware of this need, have to get certain information in order to manage their business for the purpose they determined. The purpose of this study is to develop risk management strategies on risk behaviors in decision-making during management of agricultural enterprises in Kirsehir province of Turkey which may act as an example for dry farming system. In this context, 243 agricultural enterprises managers who have the capacity to represent the province of Kirsehir, were selected by means of Purposive Sampling Method in the districts of Kirsehir-Center, Kaman, Mucur and Cicekdagi. Probability Sampling Method was used to determine the number of samples. In this context, the probability value of P was calculated as 0.35, which is the probability of the risk taking of the agricultural holding's managers. In the calculation of this ratio, preliminary study results were used. It was observed that the variables of age, education, working time in agriculture, bovine animal unit (BAU), income sources and income status variables were statistically significant in the risk taking behaviors of farm managers. On the other hand, variables such as the social security status and agricultural land (property, rent, total and irrigated agricultural land) processed by the managers of agricultural holdings did not significantly affect the risk taking behaviors of agricultural holding's managers. It is thought that the risk behaviors of the agricultural enterprise managers in Kirsehir province are not only influenced by the economic structure of the enterprises but also the economic stability of the country. National economic stability is important for the formation of the population that can take risks in agriculture for also entrepreneurship.

Keywords: Risk, organisational behaviour, agricultural management, agricultural business.

INTRODUCTION

Probability is the ratio of the total number of possible events to more subjective events (Ancombe-Aumann, 1992). It is not possible to know precisely the data to be used in future decisions. Risk is where the probability distribution of an event is known and uncertainty is unknown of it (Akalin, 1970). Decision making is a process of problem solving and defining the opportunities offered by the environment (Daft, 1991).

Regardless of the type of business, business owners want to make the best possible use of their resources in the best possible way. This situation is important for sustainable business management as well as guaranteeing the future of the enterprise. To this end, business owners try to make short- and long-term decisions in order to increase the future success of their businesses. The level of implementation of the decisions they make is also indicative of their level of success. However, decision-making can be more difficult, especially when uncertainty prevails and risk increases. Business owners who are aware of this need to know every detail about the purpose of their business and have the ability to manage them. Personnel management or employee management is the most important role among these. Especially with the

diversification and increase of technological inputs, agricultural enterprises started to increase in complexity. The increase in complexity has also started to make the effect difficult to understand (Bozoğlu *et al.*, 2001). Attitudes and behaviors of employees in agricultural holdings, where and how they position themselves in the future, how they can make decisions in case of risk and where they are necessary to know the characteristics of successful agricultural production (Simsek, 2012).

As in other enterprises, there are risks and uncertainties arising from different conditions in agricultural production. It is possible to divide the risks affecting agricultural production into two as production risk arising from nature and market risk arising from the market (Sayili and Uzunoğlu, 1998; Karahan, 2002). The lack of precipitation at the appropriate time for agricultural products, the increase in product prices after the sale of the product, the lack of sufficient labor force at the required time, the failure of agricultural equipment in unexpected situations, are the factors that reveal the risk and uncertainty. Risk analysis is necessary to reduce the negative effects of all these risks on the managers of agricultural holdings and to ensure that agricultural holdings survive under ever-changing conditions (Karahan, 2002).

During the examination of the literature it has been observed that there are many studies on risk factors in agricultural holdings. Sahin *et al.* (2008) determined that the risk factor that affects agricultural production the most, is the production technique. They found that the most effective strategic measure was to use new production techniques. Akçaöz *et al.* (2006) worked in Antalya Central, Serik and Manavgat districts and reported that changes in input costs was the most important risk factor and determined risk strategy as to reduce borrowing. Şahin and Miran (2010) discussed the planning of agricultural holdings with a game theory approach under risk conditions. They concluded that the game theory developed for risk averse producers changed the composition of the production pattern as a result of the optimal plan. Bayramoğlu (2014), worked in Konya with cherry producers and they classified as risk bearers and risk haters by using preference scale. He was determined that total facility area, family work power potential, share of cherry land in the total facility area, number of production activities, producer age, education level and total income of fruit gardens are important factors on the risk behaviours of the farmers.

MATERIALS AND METHODS

Research Area: Kırşehir is located in Turkey's Central Anatolia Region Central Kızılırmak basin. About 90% of the province's agricultural land is dominated by dry farming system. It is one of the provinces with significant potential in cereal, legume and red meat production. 42% of the population lives in rural areas. Since the realization of interest in rural areas is not cut by urbanization, the rate of the population in agriculture is quite high. Approximately 65% of the working population is employed in agriculture (KTOIM, 2019). In the province where agricultural potential and agriculture-based lifestyle is widespread, it is important to use the available resources more efficiently and to support agricultural entrepreneurship in order to reach the desired level in agricultural production. Therefore, it is necessary to create a mass of producers who are willing to take risks (risk seeking). The purpose of this study was to determine the risk taking tendencies of the producers engaged in agricultural production in Kırşehir and to reveal the factors that affect these tendencies will constitute an important data source for the policies to be established about the efficient use of agricultural potential in Kırşehir.

Data collection and sampling methodology: The study was conducted at 4 districts of the Kırşehir Province. These districts were selected based on Purposive Selective Sampling Method. In Kırşehir province, there are 7 districts and these districts have 19,934 farmers in the Farmer Record System (FRS) database for 2018-19 production season. According to the FRS database in the research area, 14,636 farmers were recorded as farms in 2018-2019 production season. Hence the sampling area represented the population

with covering 73.42% farmers of the population. Proportional Sampling Method was used to determine the sample size by using the following formula (Yamane, 2001);

$$n = \frac{N * p * (1 - p)}{(N - 1) * \sigma_p^2 + p * (1 - p)}$$

$$\sigma_p^2 = \left(\frac{r}{Z_{\alpha/2}} \right)^2$$

Where; n: Sample size, N: Number of enterprises in the population, σ_p^2 : Variance of the ratio, r: Permissible margin of error (10%), $Z_{\alpha/2}$: The ruler value of z (1,65) p: Indicates the possibility of risk seeking among farmers within the population (Preliminary questionnaire was determined by the study p: 0.35, q: 0.65).

The number of surveyed farmers was 243 with 95% reliability ($z = 1.65$) and 5% deviation from the average. The distribution of the number of surveys by districts was based on the ratio of the number of farmers registered to the 2018 district-based FRS. Accordingly, the distribution of the number of surveys by districts presented in Table 1.

Table 1. The distribution of sample size by districts.

Districts	The Number of Farmers Recorded in Farmers Record System (FRS) in 2018*	The Percentage of Farmers in Total Farmers (%)	The Distribution of Sample Size By Districts
Çiçekdağ	3005	20.53	50
Kaman	4306	29.42	71
Merkez	3911	26.72	65
Mucur	3414	23.33	57
Total	14636	100.00	243

In order to evaluate the survey data, a database was created and the survey data was entered into this database for analyses. Since the sample did not show a normal distribution, non-parametric chi-square independence tests were performed. In order to determine the risk behavior by using the previous studies, it was tried to test the hypothesis whether there is a statistically significant relationship among demographic, economic and agricultural variables at 90%, 95% and 99% confidence levels by using chi-square independence test. In the analysis of continuous data, variance analysis was used from parametric tests (Kesici and Kocabaş, 2007).

In this study, the managers of agricultural holdings were described as risk seeking, risk neutral and risk averse and analysed their risk behaviours according to the factors which are demographic, economic and agricultural.

RESULTS AND DISCUSSION

The variables used to determine the risk taking tendencies of the producers in the research area and descriptive statistics of these variables are presented in Table 2. It can be seen that the variables have been grouped under 3 groups. These are

Table 2. Descriptive statistics of agricultural holdings in the research area.

Variables		Count	%	Mean	
Risk Behavior	Risk Seeking	102	41.98		
	Risk Neutral	26	10.70		
	Risk Averse	115	47.32		
Demographical Variables	Age Intervals	18-24 Age	16	6.58	
		25-34 Age	18	7.41	
		35-44 Age	43	17.70	
		45-54 Age	70	28.81	
		55+ Age	96	39.51	
	Education Level	Illiterate	9	3.70	
		Primary School	164	67.49	
		Secondary School	45	18.52	
		Higher Education	25	10.29	
	Social Security	No Social Security	18	7.47	
		BAĞKUR-Farmers	40	16.60	
		Others	183	75.93	
	The Number of Children				
Economic Variables	Distribution of Agricultural Income	Crop Production	97	42.54	
		Animal Production	65	28.51	
		Both of Them	66	28.95	
	Income Source (Agriculture) (%)				56.04
	Income Source (Non-Agriculture) (%)				43.96
	Income (Subjective Poverty)	Poor	10	4.12	
		Middle	171	70.37	
		Good	62	25.51	
Agricultural Variables	Experience on Crop Production (Years)				24.00
	Experience on Animal Production (Years)				22.00
	Total Working Days in Agriculture Activity (Days)				124.00
	Own Area (Ha)				11.77
	Rented Area (Ha)				3.33
	Total Area (Ha)				15.09
	Total Irrigated Area (Ha)				2.45
	Bovine Animal Unit (BAU)				16.93
	Information Source	Informal	217	90.79	
Formal		22	9.21		

demographic variables, economic variables and agricultural variables.

Demographic variables are the most important variables that may affect the risk behaviors of agricultural managers in agriculture. Especially the age, educational level, number of children and social security conditions of the managers are among the factors that may affect the risk behaviors. The age and risk behaviors of the managers of agricultural holdings in the research area is presented in Table 3. An age group of 18-40 in Turkey is defined as young farmers (TOB, 2019). The data indicates a statistically significant relationship between age and risk behaviors of managers of agricultural holdings. It was determined particularly that the younger group under the age of 40 was more active in risk taking than other risk groups. In studies conducted on this issue in Turkey, some researchers did not find statistically significant relationship

between age factor and risk-taking behavior managers of agricultural holdings (Grable and Lytton, 1998; Guiso and Paiella, 2008; Mancini and Eren, 2017), but many researchers found that young managers of agricultural holdings were more willing to take risks (Baker and Haslem, 1974; Akçaöz and Akdemir, 2001; Hallahan *et al.*, 2003; İkkat Tümer *et al.*, 2010; Dohmen *et al.*, 2011; Farrel, 2014).

Another important demographic factor affecting the behavior of individuals was the educational status of individuals. The literature on the relationship between education level and entrepreneurship level states that there are relationships between two factors (Grable and Lytton, 1999; Dohmen *et al.*, 2011; Keleş *et al.*, 2012; Türkoğlu *et al.*, 2017; Özdemir and Toker, 2018) but few researchers opposed this relationship in their studies (Hallahan *et al.*, 2003; Doganer and Altunoglu, 2010). Entrepreneurship in agriculture, and consequently

Table 3. The relationship between risk behavior and age interval of agricultural holding managers.

		Age Intervals					Total
		18-24 Age	25-34 Age	35-44 Age	45-54 Age	55+ Age	
Risk Seeking	Count	13	11	21	24	33	102
	%	12.75	10.78	20.59	23.53	32.35	100.00
Risk Neutral	Count	1	2	5	10	8	26
	%	3.85	7.69	19.23	38.46	30.77	100.00
Risk Averse	Count	2	5	17	36	55	115
	%	1.74	4.35	14.78	31.30	47.83	100.00
Total	Count	16	18	43	70	96	243
	%	6.58	7.41	17.70	28.81	39.51	100.00

Pearson Chi-Square: 20.29 SD: 8 Asymp. Sig. (2-sided): 0.01

taking risk-taking behavior, is slightly different from other sectors. Risks and uncertainties in agriculture sector are higher than other sectors. Especially the low economic return in agriculture in recent years is due to the slow diffusion of innovative developments into the agricultural sector. Therefore, entrepreneurship in agriculture requires more experience and knowledge than other sectors. Bringing agriculture together with innovation and creating an agricultural society in which entrepreneurial culture is widespread, is very important for the development of agriculture. On examining structural status of the agriculture sector noted that producers in the industry in developing countries such as Turkey are with low education level. It is thought that this situation may adversely affect the increase in entrepreneurship in the agricultural sector. Therefore, there are few studies focusing on entrepreneurship in agricultural society (Fitz-Koch *et al.*, 2018). In Turkey, there are some projects in recent years, such as Young Farmers Support Projects, Expert Hands Support which are increasing the capacity of young people to continue their agriculture. These studies are important initiatives that increase the entrepreneurship in agriculture and consequently the tendency to take risks (Kan *et al.*, 2018). The relationship between farm managers and their education levels was examined with Chi-square Test and the results are presented in Table 4, which shows that the higher the education level of

business managers, the higher will be their risk taking behaviors.

Another important variable in agriculture is the social security status of agricultural business managers. The producers dealing with agriculture in Turkey, were taken under the social security system as BAGKUR-Farmer before being combined under one roof in 2016. It is known that producers stay away from the social security issue due to different reasons, especially low agricultural income. In addition, when viewed sectoral distribution of the records in terms of unregistered employment, the highest unregistered employment in Turkey is in the agricultural sector. According to the Turkey Statistical Institute data (2018), the ratio was declared as 82.73% (SGK, 2019). Although there is a downward trend on the basis of years, unregistered employment in the agricultural sector affects social security records negatively. The people dealing with the agricultural sector in Turkey are mostly producer, not farmer. This situation indicates that these people were registered to social security institutions in non-agricultural areas. In the study area, it was observed that 92.53% of agricultural business managers have social security but only 16.60% have BAGKUR-Farmer. In other words, 75.93% people with social security, have social security records in non-agricultural areas. Although the level of social security in the risk-seeking group was higher than others, the relationship between the

Table 4. The relation between risk behaviors and education levels of agricultural holdings managers.

Risk Level		Education Level				Total
		Illiterate	Primary School	Secondary School	Higher Education	
Risk Seeking	Count	5	59	20	18	102
	%	4.90	57.80	19.60	17.60	100.00
Risk Neutral	Count	0	21	4	1	26
	%	0.00	80.80	15.40	3.80	100.00
Risk Averse	Count	4	84	21	6	115
	%	3.50	73.00	18.30	5.20	100.00
Total	Count	9	164	45	25	243
	%	3.70%	67.50	18.50	10.30	100.00

Pearson Chi-Square: 13.49 SD: 6 Asymp. Sig. (2-sided): 0.04

social security status of managers and risk behavior was not statistically significant (Chi square: 6.55, p: 0.16) (Fig. 1). However, in studies on young farmers in Turkey, there is a theory that supporting young farmers in terms of social security in rural areas can increase the agricultural entrepreneurship of young farmers in rural area (Doğan *et al.*, 2018).

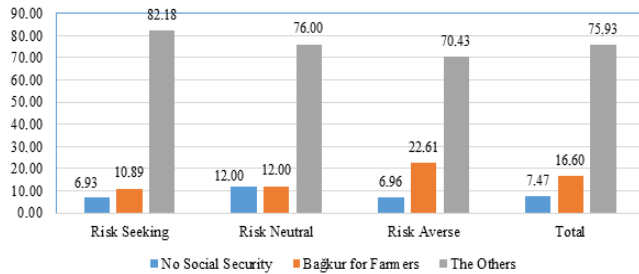


Figure 1. The relation between risk behaviors and social security situation of agricultural holdings managers.

Turkey is among the top 10 countries in the world in terms of agricultural production value (Yavuz and Dilek, 2019). It is aimed to increased this value in agriculture sector, both investments and incentives, within the framework of 2023 vision of Turkey and bring Turkey among the top 5 in the world. In order to increase the value of agricultural production, it is necessary to increase the added value in agriculture and increase the entrepreneurial capacity within it. In this context, satisfaction level of agricultural production is of great importance. Satisfaction level is an important indicator that ensures the continuity of agricultural production. In this study, it was estimated that about half of the producers were satisfied with agricultural production. The relationship between the satisfaction level and risk taking behaviors of farm managers was statistically non-significant (Table 5). Theoretically, it is expected that the satisfied producer community will tend to take more risks. The lack of a statistically significant relationship between two variables means that the farming community in Turkey think that the agricultural sector may have sufficient reliability to take risks.

Table 5. The relation between risk behaviors and satisfaction on agriculture of agricultural holdings managers.

Risk Level		Satisfaction Level of Agricultural Holdings Managers in Agriculture					Total
		Never Satisfy	Not Satisfy	Indecisive	Satisfy	More Satisfied	
Risk Seeking	Count	24	12	17	37	10	100
	%	24.00	12.00	17.00	37.00	10.00	100.00
Risk Neutral	Count	5	5	2	11	3	26
	%	19.20	19.20	7.70	42.30	11.50	100.00
Risk Averse	Count	12	24	19	49	10	114
	%	10.50	21.10	16.70	43.00	8.80	100.00
Total	Count	41	41	38	97	23	240
	%	17.10	17.10	15.80	40.40	9.60	100.00

Pearson Chi-Square: 10.30 S.D. 8 Asymp. Sig. (2-sided):0.25

Table 5. The relation between risk behaviors and agricultural variables of agricultural holdings managers.

Risk Level		Own Land (Ha)	Rented Land (Ha)	Total Land (Ha)	Total Irrigated Land (Ha)	Working Days in Agric. (Days)	Agric. Income (%)	Non-Agric. Income (%)	Bovine Animal Unit
Risk Seeking	Mean	13.78	4.59	18.37	2.93	151.20	48.54	51.34	23.15
	N	102	102	102	102	79	82	82	102
	Stand. Dev.	25.08	13.94	27.06	11.27	118.09	28.74	28.900	53.45
Risk Neutral	Mean	7.76	1.16	8.92	1.90	123.86	55.71	44.29	7.53
	N	26	26	26	26	21	21	21	26
	Stand. Dev.	7.90	2.74	8.54	3.99	99.69	25.80	25.80	17.67
Risk Averse	Mean	10.88	2.70	13.58	2.15	101.37	61.92	37.42	13.55
	N	115	115	115	115	95	99	99	115
	Stand. Dev.	14.51	6.53	17.03	7.94	90.25	27.38	27.11	21.41
Total	Mean	11.77	3.33	15.09	2.45	123.98	55.84	43.79	16.93
	N	243	243	243	243	195	202	202	243
	Stand. Dev.	19.29	10.16	21.43	9.19	105.50	28.37	28.36	38.36
F Value		1.24	1.61	2.60	0.25	5.01***	5.20***	5.65***	2.60*

Statistically important at *90%, **95%, 99% confidence levels.

This is one of the most important consequences of economic uncertainties.

It is thought that important agricultural variables such as land capital and livestock capital as well as income sources and the place of agriculture in total working time may affect risk-taking behaviors of agricultural holding managers. Hence, these variables are associated with the risk behaviors of the managers (Table 5). The statistical analysis determined that the land asset variables (own land, rented land, total land, total irrigated land) that make up the land capital did not change significantly according to the risk taking behaviors of the managers. In addition, it was observed that the presence of animal number constituting the animal capital varies statistically significant according to risk behavior levels. It was further determined that producers with more animal assets tend to take more risks. Livestock (particularly large horned livestock) is very important in the agricultural sector of Kirsehir, and it provides 1.77 of Turkey's total red meat needs (AHIKA, 2017). Therefore, animal husbandry sector is an important center of attraction in the province in terms of risk taking and agricultural entrepreneurship. Other important variables were the time of producer's engagement with agriculture and sources of income (Table 5). It was observed that producers who spent more time with agriculture tend to take more risks. In terms of income sources, producers see the surplus of non-agricultural income as a favorable environment for taking risks rather than agricultural income. This is due to the fact that the agricultural income is low and the producer does not want to take risks by relying on agricultural income (due to the high risks and uncertainties of agriculture).

The income factor is considered to be an important variable in the risk behavior of the producer in the agricultural sector. Theoretically, it can be said that the high income group will have more tendency in risk taking. It supports this theory in studies on this subject (Jianakoplos and Bernasek 2006; Dohmen *et al.*, 201; Şeşen and Basım, 2012; Farrell, 2014). The relationship between income status and risk taking behaviors of producers engaged in agriculture in Kirsehir province was found statistically significant. Those with good

income tend to take more risks (Table 6). This supports the results presented in Table 4. Economic concerns are an important factor in risk taking behavior.

Conclusion: Agriculture differs from other sectors in terms of entrepreneurship and consequently risk taking behaviors. Entrepreneurship environment and culture in agriculture is difficult to establish because of the high risks and uncertainties in agriculture. In addition, the stability of the national economy also affects entrepreneurship. Therefore, producers in the agricultural sector do not tend to take too much risk. This study on relations of agricultural producers/managers demographic, economic and agricultural variables with risk taking behaviours is an example for areas where the rainfed agricultural conditions and livestock sector are dominated. It was also observed that the variables such as age, education level, working time in agriculture, owned BAU, income sources and income status were statistically significant in the risk taking behaviors of agricultural business managers. On the other hand, variables such as social security status and agricultural land processed by farm managers (property, rent, total and irrigated agricultural land) did not significantly affect the risk taking behaviors of farm managers. In Kirsehir province, the variables that are particularly effective in determining the risk behaviors of agricultural producers are important not only because of the economic structure of the enterprises but also the economic stability of the country. National economic stability is important for the formation of the population that can take risks in agriculture that are important for entrepreneurship. In order to increase the level of entrepreneurship and risk taking in the agricultural sector, it is important to create environments that will make the producers feel more secure. Especially in agriculture, risk management is important in creating this environment. Income insurance in agriculture should be taken into consideration as well as covering the losses caused by disasters with agricultural insurances. It is necessary to eliminate the social security problems of the farmers. In addition, the entrepreneurial capacities of

Table 6. The relation between risk behaviors and income level of agricultural holdings managers.

Risk Level		Income Level			Total
		Poor	Middle	Good	
Risk Seeking	Count	2	65	35	102
	%	1.96	63.73	34.31	100.0
Risk Neutral	Count	1	18	7	26
	%	3.85	69.23	26.92	100.0
Risk Averse	Count	7	88	20	115
	%	6.09	76.52	17.39	100.0
Total	Count	10	171	62	243
	%	4.12	70.37	25.51	100.0

Pearson Chi-Square: 9.59 S.D: 4 Asymp. Sig. (2-sided):0.05

educated farmers, who are real producers, should be increased by revealing the difference between producers and farmers.

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